Is Apple OK? **32** Cloud Vendors Face Backlash Over NSA Surveillance **7**

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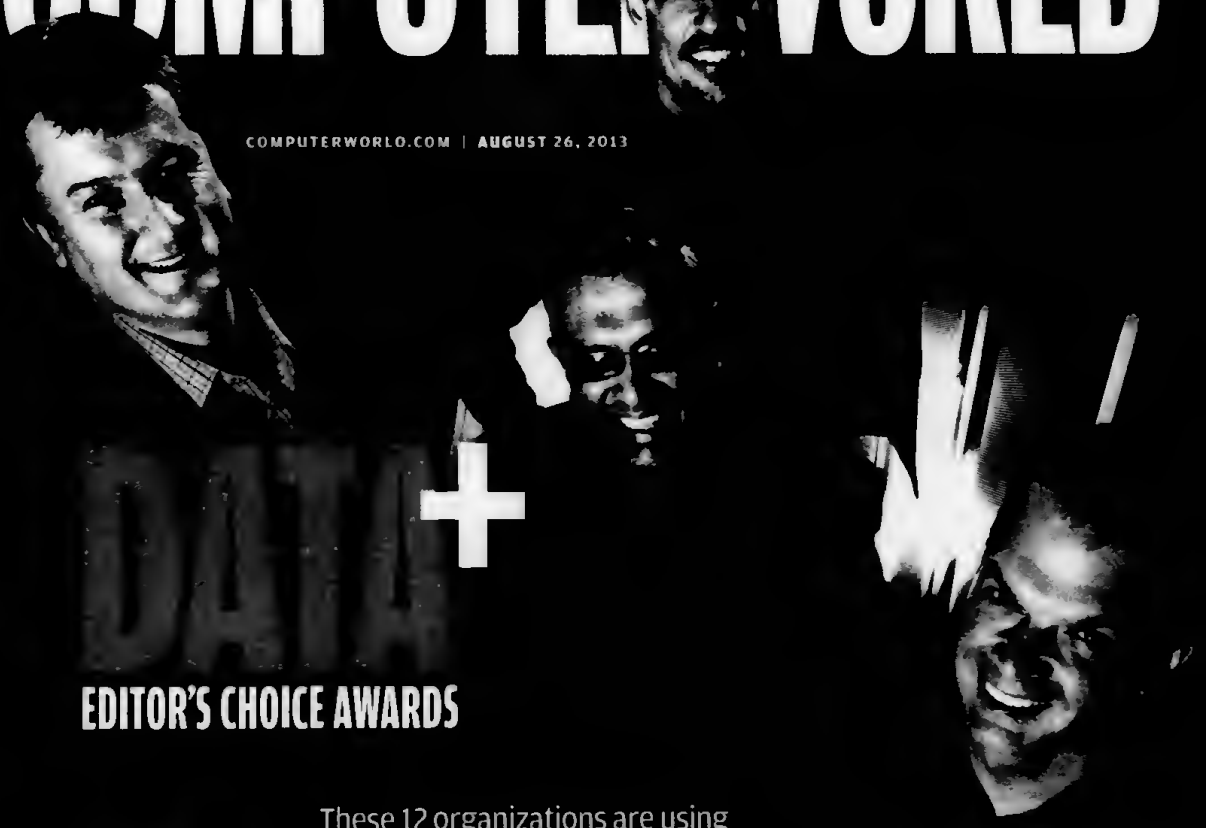

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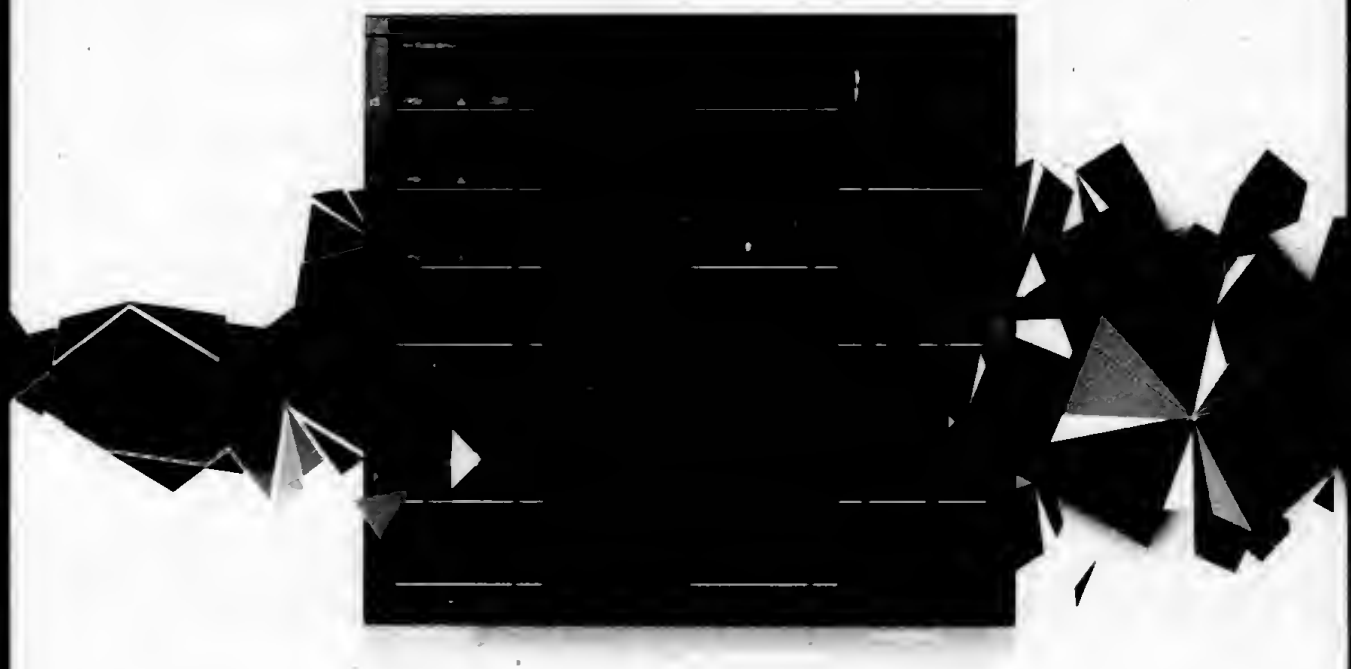

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intel inside Xeon

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COMPUTERWORLD

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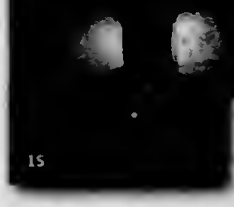

The 12 winners of *Computerworld*'s first-ever Data+ Editor's Choice Awards are using big data and business intelligence tools to analyze market trends, predict future developments and generate immediate returns. Chosen by a panel of *Computerworld* editors, these organizations are well aware that they're sitting on gold mines of information, and they're setting the pace in the field of business intelligence. Coverage begins on **page 13.**

THE WINNERS

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18 Pinellas County Juvenile Welfare Board spends wisely with the help of BI.

20 Novation turns to big data to control medical supply costs.

21 Ingram Micro automates contract renewals with BI.

21 Catalist analyzes data to give pols an edge in close elections.

22 Constant Contact studies big data to improve email marketing.

23 Express Scripts helps doctors and patients find lower-cost medications.

24 Vanguard Health Systems adds $62 million in new revenue.

25 Harvard University uses a computing grid to share research data.

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HeadsUp

PHOTO COLLAGE STEPHEN SAUER/SHUTTERSTOCK

OPERATING SYSTEMS

Hackers May Cash In on XP's Retirement

HACKERS COULD find themselves in the catbird seat on April 8, 2014 — the day Microsoft plans to stop patching Windows XP. As security expert Jason Fossen sees it, those who have zero-day exploits for XP will bank them until that day and then sell them to crooks or loose them themselves on unprotected PCs.

It's simply economics at work, said Fossen, a trainer for the SANS Institute since 1998.

"The average price on the black market for a Windows XP exploit is $50,000 to $150,000, a relatively low price that reflects Microsoft's response," said Fossen. When a new vulnerability — dubbed a "zero-day" — is detected, Microsoft investigates, pulls together a patch and releases it to XP users.

But the price will go up when Microsoft stops patching its aged operating system.

Fossen acknowledged that there really aren't any precedents to back up his speculation, because the last time Microsoft retired an operating system was in July 2010, when it pulled the plug on Windows 2000, which wasn't nearly as widely used as XP is.

Computerworld has projected that Windows XP will still run 33% to 34% of the world's PCs at the end of April 2014.

HD Moore, creator of the popular Metasploit penetration testing toolkit and chief security officer at security company Rapid7, agreed that XP hacks would become more valuable after the operating system's retirement in April 2014, but he contended that all Windows vulnerabilities would jump in value at that time.

– *Gregg Keizer*

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SMARTPHONES

A New Owner May Be No Help for BlackBerry

A permanent change seems to have taken hold in the mobile market, as BlackBerry explores the possibility of putting itself up for sale.

The company had pinned its hopes on the BlackBerry 10 operating system, but its phones have now slipped into fourth place in the mobile market behind Windows Phone devices, according to IDC and other analyst firms.

That slip seemed to play a key role in BlackBerry's decision, announced earlier this month, to set up a committee to explore options such as selling the company or finding a partner to work with.

IDC last week said that BlackBerry's market share fell to 2.9% in the second quarter – its lowest point since the firm started tracking BlackBerry devices. Windows Phone had market share of 3.7%, while Android led with nearly 80% and iOS held 13.2%.

Noting that BlackBerry has lost ground in its traditional stronghold, the enterprise market, Gartner analyst Bill Menezes said even new ownership "[is] not going to address how the company restores itself."

BlackBerry does have some attractive assets, including the core QNX operating system behind BB10, BlackBerry Enterprise Service software, numerous patents and the BlackBerry Messenger brand.

– MATT HAMBLEN

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BETWEEN THE LINES
By John Klossner

IT SERVICES

Outsourcer Sued as Bloat Kills Project

AN EFFORT to modernize Orange County, Calif.'s tax collection system that was supposed to take three years and cost $8 million was on track to cost twice that amount and take twice as long when officials pulled the plug.

Instead of seeing the project through to completion, Orange County abandoned the effort, declared the software "fatally flawed" and in April filed a lawsuit against the contractor.

The two sides — the county and the contractors, Tata Consultancy Services and its U.S.-based subsidiary — are now attempting to reach a mediated agreement, according to the most recent federal court filing.

In 2007, Orange County hired Tata America International, a subsidiary of the world's largest offshore provider of outsourced IT services — Mumbai, India-based TCS — to develop custom software to handle most of the county's tax functions. The county collects some $4.5 billion in taxes each year.

Before hiring Tata, the county had used another contractor to develop the business documentation for the project. That documentation ran more than 6,000 pages and outlined every aspect, from legal requirements to operating systems.

Tata was the winning bidder for the job, offering to do it for just over $8 million. As part of the contract, TCS proposed that all work on the tax project "be performed onsite at the county offices in Orange County."

Instead, the county states in its legal filings, many of the people that TCS assigned to the project "worked and lived in India" — a logistical complication that contributed to delays and communication problems.

The county says it will have to start over from scratch.

In a statement, a TCS spokesman said it's company policy not to discuss pending legal matters, but added that TCS stands by the quality of its work. "Over 98% of our business comes from repeat clients," the spokesman said.

– *Patrick Thibodeau*

Micro Burst

The number of self-driving cars sold worldwide is projected to reach

per year by 2035.

HARDWARE

IBM to License Power Chip Design To Google, Others

IBM has joined forces with Google as it moves to expand the use of its Power platform and reverse declines in its hardware business.

The strategy involves licensing designs of the Power microprocessor architecture to Google and other companies through an alliance called the OpenPower Consortium. Consortium members will be able to make Power chips, and component companies will be able to make hardware that can be integrated with the processor.

OpenPower members include graphics chip maker Nvidia, server maker Tyan, and Mellanox, which makes networking and storage equipment. The first alliance products could be based on IBM's new Power8 design, said Brad McCredie, vice president and CTO for IBM's Systems and Technology Group.

For its part, Google, which designs its own servers, could create its own integrated chip – also called a system on a chip – based on the Power architecture, said Mercury Research analyst Dean McCarron.

That could help IBM realize its goal of pushing Power chips into more servers, which could in turn prop up its other businesses, McCarron said.

AGAM SHAH AND JAMES NICCOLAI, IDG NEWS SERVICE

BETWEEN THE LINES
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– AGAM SHAH AND JAMES NICCOLAI, IDG NEWS SERVICE

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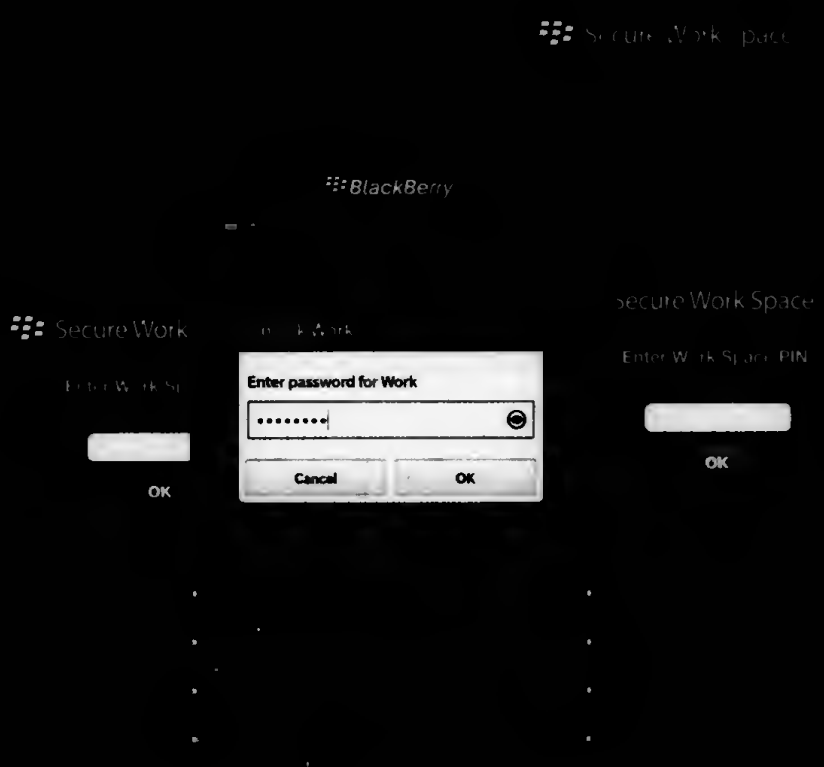


BlackBerry

Keep Moving

Public-Sector CIOs Are Heading for the Exits

Low pay, the federal sequester, press scrutiny and other factors all likely contribute to a growing turnover rate among government IT leaders. By Patrick Thibodeau

AT A TIME OF GOVERNMENT CUTBACKS, the tenures of public-sector CIOs are getting increasingly shorter than those of their private-sector counterparts.

Gartner's latest annual worldwide survey of some 2,000 CIOs in all sectors of the economy, including government, found that local, state or federal CIOs in the U.S. and Canada stay in their posts an average of 3.4 years. Gartner's 2012 survey found that such CIOs kept their jobs for 4.2 years, the same average tenure as the 2011 survey found.

In contrast, the average tenure for private-sector CIOs in the U.S. and Canada was five years in 2011, 4.7 years in 2012 and 5.7 years this year, Gartner found.

The survey was conducted in the fourth quarter of last year.

Analysts and government CIOs say there is no single explanation for the shrinking tenure of public-sector tech execs.

Recent elections, the federal sequester, salary freezes and public-sector bankruptcies may have played roles in the trend.

Also, they noted, CIOs who put off retirement during the economic downturn may now be choosing to leave their jobs.

Carlos Ramos, CIO of the state of California, pointed out that state and, to a lesser extent, city and county CIOs may be employed at the will of elected officials. Ramos himself, for instance, was appointed by California Gov. Jerry Brown in 2011.

Also, he said that salaries of public-sector CIOs are significantly lower than those of their private-sector colleagues. "Public-sector CIOs often leverage their credentials to go off into the private sector to make more money," Ramos said.

Moreover, public-sector CIOs must deal with diffuse decision-making and bureaucratic processes that can be trying, especially in a sector where there is "little tolerance for failure of an IT initiative," Ramos said.

Bill Schrier, a program manager in the office of Washington state's CIO and former CTO of the Seattle city government, said the public nature of the job and the accompanying exposure to media scrutiny can take a toll on some people.

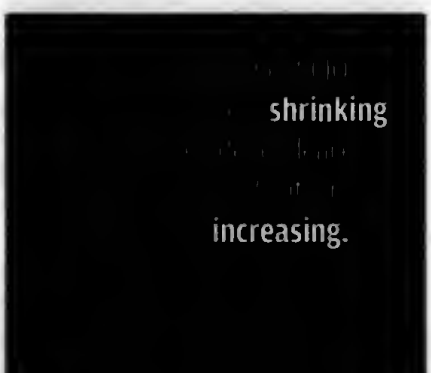
Organizational issues can also be stressful for public-sector CIOs — many large government entities have multiple IT shops with their own departmental directors and CIOs. "This makes it really hard for the central CIO to succeed, because he or she is continually herding cats to get anything done," said Schrier.

He did note that the tenures of public-sector IT leaders may be more stable in those cities and counties that aren't run by elected officials, but rather by professional city or county managers. Those managers often have tenures of a decade or more, so changes in IT management aren't likely to happen as frequently as they do at, say, the state level, he said.

Brenda Decker, CIO of the Nebraska state government and president of the National Association of State Chief Information Officers, said government CIOs often don't take the jobs for the money, benefits or recognition. "People that take government CIO jobs do it because they have a desire to serve the public and their state," she said.

With that mindset, they may also have "a predetermined period of time that they are planning to make the commitment to the state," she added.

Whatever the reasons, said Gartner analyst Rick Howard, "government CIO tenure is shrinking at a time when dependence on information and data in government is increasing." ◆



THINKSTOCK

U.S. Cloud Vendors Face Backlash Over Prism

Reports suggest that the news about the NSA's secret data-collection program is causing foreign users to look elsewhere for cloud-based services.

By Patrick Thibodeau

EDWARD SNOWDEN'S revelations about the National Security Agency's Prism surveillance program could cause U.S. providers of cloud-based services to lose 10% to 20% of the foreign market — a slice of business valued at up to $35 billion.

A new report from the Information Technology & Innovation Foundation (ITIF) concludes that European cloud computing companies, in particular, might successfully exploit users' fears about the secret data collection program to challenge U.S. leadership in the hosted services business.

Daniel Castro, author of the report, acknowledges that the conclusions are based, so far, on thin data, but nonetheless argues that the risks facing U.S. cloud vendors are real.

Indeed, a month prior, the Cloud Security Alliance reported that in a survey of 207 officials of non-U.S. companies, 10% of the respondents said that they had canceled contracts with U.S. service providers after Snowden's leak of NSA Prism documents earlier this year.

"If U.S. companies lose market share in the short term, it will have long-term implications on their competitive advantage in this new industry," said Castro in the ITIF report. "Rival countries have noted this opportunity and will try to exploit it."

To counter such efforts, the U.S. must challenge overstated claims about the program by foreign companies and governments, said Jason Weinstein, a partner in the Washington office of law firm Steptoe & Johnson and a former federal prosecutor and deputy assistant attorney general specializing in computer crime.

"There are a lot of reasons to be concerned about just how significant those consequences will be," Weinstein said. "The effort by European governments and European cloud providers to cloud the truth about data protection in the U.S. was going on well before anyone knew who Edward Snowden was. It just picked up new momentum once the Prism disclosures came out."

Weinstein contends that European countries have fewer data protection rules than the U.S.

For example, he said that in the U.K. and France, a wiretap to get content can be issued by a government official without court authority, but that can't happen in the U.S.

"U.S. providers have done nothing other than comply with their legal obligations," he said. But because of Snowden's leaks, "they are facing potentially significant economic consequences."

Gartner analyst Ed Anderson said his firm has yet to see any revenue impact on cloud providers since the Prism disclosures, but added, "I don't think Prism does U.S. providers any favors, that's for sure."

Nonetheless, Anderson added, "I think the reality is [the controversy] is likely to die down over time, and we expect adoption to probably continue on the path that it has been on."

One reason why U.S. providers may not suffer is because "the alternatives aren't great if you are a European company looking for a cloud service," he said.

Like Weinstein, Anderson said European governments also access private online data. "If you think that Prism is the only program in the world where a government is inspecting private data, you are pretty naïve," he said.

Nonetheless, Anderson did warn that continued "missteps on the part of the U.S. government" could have a long-term impact on the worldwide perception of the U.S. cloud computing business. ♦

Jaikumar Vijayan *contributed to this story.*

> I don't think Prism does U.S. providers any favors, that's for sure.

THE Grill

Steve McManama

This CIO says IT has to change how it recruits talent.

Are you ever completely unplugged? I spend a good amount of time on the beach reading, and I try not to have any technology near me at that time, although I do use a Kindle.

If you weren't in IT, what would you do? I would probably be a teacher or a coach. I do a lot of mentoring with kids.

What's the best advice you've ever received? It's important to be assertive; don't wait for anyone to say, "Come on." It's up to you. You've also got to sell yourself.

What are your favorite nonwork activities? Tennis, swimming, reading and spending time with family.

PHOTOS COURTESY OF COVIDIEN

AS AN IT EXECUTIVE *at a global company, Steve McManama says he's keenly aware of the need for an IT team that's not just talented, but diverse, too. McManama is vice president of global shared services and CIO at Covidien, a $10 billion global healthcare products maker. His tenure with the company dates back to 1981, and his other roles there include serving as the executive sponsor of Covidien's Women in Technology (WIT) program and sitting on the company's Executive Steering Committee of Diversity & Inclusion. Here McManama talks about the importance of diversity in IT and other topics crucial to CIOs today.*

Why sponsor the Women in Technology program? I wanted to show Covidien's commitment to fostering a diverse workforce where everyone can reach their full potential. This is a global network, and we bring together employees across regions and across the globe. Having said that, it's a new network — it's less than six months old. So right

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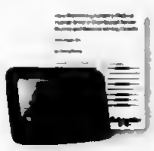

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> **The healthcare landscape is changing rapidly,** and we need to [keep up]. A diverse organization is going to help us get there.

now it's awareness, what we can do, what we hope to do, what we're planning on doing.

And beyond that? What I hope to do is create a very level playing field in the area of recruiting from a diversity perspective and from a female perspective. And I hope in the next couple of years we do a better job at developing a much more diverse leadership organization within my IS organization.

Isn't it enough to have IT workers with strong tech and business skills? First off, people who work in my organization have to be technically skilled and competent. But it's equally important, if not more important, that they understand the business and can partner with the business. The technology world is moving fast, and the healthcare landscape is changing rapidly, and we need to [keep up]. A diverse organization is going to help us get there.

What are the biggest challenges to creating a diverse IT workforce today? The first challenge is finding the right talent, and we as an organization have had to reconsider how we approach recruiting and not rely just on what's worked in the past. Historically, IT organizations have hired to fill a specific need. We can't continue to do that to get the right talent. We also need people who have the talent and potential to grow versus just the specific technical skill we need. And once we're recruiting that talent, we have to ensure that they have the tools, resources and training to grow. We have to make talent development a priority within our organization more than we have in the past.

Does this view of recruiting ensure you get the diversity you want? What we're also doing is having a diverse slate of candidates through our recruiting process. That's something we've focused on in the past 12 to 24 months. You still end up hiring the right person for the job, but by looking at more than that technical need, we have seen a significant increase in more diverse hiring and people with higher potential.

You've had a lengthy tenure for a CIO. Does a long-serving CIO have advantages? A long-serving CIO does bring advantages. On a daily basis, he or she crosses over all areas of the business and needs to have a thorough understanding of the whole business.

But even though I've been with one company, we've transformed ourselves many times over. We've acquired many companies and divested many companies. I've had the opportunity to see how companies around the globe operate. So I think I have the benefit of both areas: being in one company for a long time and seeing many other companies.

What do you and other CIOs need to focus on in the upcoming years to ensure your organizations are competitive? We have to focus on getting information to the people immediately and getting it to them accurately and securely. That's not something we're used to. We're used to controlling information. People still want it accurate and secure, but they want it yesterday. That's a huge challenge for us, to provide for the ever-changing needs of our customer but keeping it secure and accurate .

Ever-changing needs — how do you anticipate and prepare for those? I've hired some very good people and part of their jobs is to help me and the organization stay current, so I have individuals who are constantly doing the research with the organization regarding infrastructure, what's happening, what's changing.

What's your biggest technology initiative today? We're defining global processes and implementing an ERP system matching those global processes. We've actually traveled around the world to understand what the business processes are, what's needed and what's nice to have, and we're bringing it all together.

You also serve as a board member for the Global Healthcare Exchange (GHX). Does that make you a better CIO? All the medical device companies got together to form this organization. So I serve on that board with members of companies that we compete against. The main thing I've learned is not so much from a technology perspective, but I've learned about the [industry] as a whole. And to be a good CIO, to be a good executive at any company, you've got to understand who your customers are, who you're there to serve. [So through this] I've learned a lot more about what's important to the customer.

— Interview by Computerworld *contributing writer* **Mary K. Pratt** *(marykpratt@verizon.net)*

OPINION

THORNTON A. MAY

One Thing We Know About The Future Is It's Coming

Enterprise IT has rarely ever been prepared for the future.

THIS IS HOW I ROLL. For the past 25 years, I have marked the end of summer not by devouring the closing page of the latest beach read or squeezing a lime into the final gin and tonic of the season, but by asking IT leaders, "What are you doing to prepare for the future?"

Two responses have typically predominated. Over the years, CIOs have said that they were either "fixing" IT or "focusing" IT on delivering what the business needs.

Here's some good news: This year's data indicates that "fixing IT" has all but disappeared from line-of-sight preparations for the future. I am pleased to report that in 78% of the Global 2000, IT does not suck. The various IT modernization efforts launched slowly and with limited funding in the shadow of the financial trauma of 2007-11 appear to have taken hold. Most of the "turnaround" CIOs who were airlifted into troubled IT shops have stabilized computational resources and succeeded in rendering enterprise IT nontoxic to key stakeholders.

The IT community is to be commended for this. We are talking about rendering a massively heterogeneous, mind-bogglingly complex array of technologies and methodologies that border on being unmanageable into a stable and value-producing asset. That was accomplished in the face of ridiculously low budgets, a vendor marketing approach in which more money is spent on golf outings and sporting events than on R&D or thought leadership, and a tragically tech-illiterate corps of executives. Kudos all around for the IT tribe.

Having gotten IT somewhere that was well worth going to, we still have to wonder what more the future holds. (It's a question that will expire only when we have no more future to look forward to.) Well, it would be nice if IT budgets went up, but we can't expect that anytime soon. I seriously envision a day when boards of directors will fire CIOs for not spending enough money on IT, but you don't need me to tell you that that day has not yet arrived.

And it isn't just our own budgets that matter. All IT practitioners wish that our suppliers spent less on the swag (pens, flash drives, T-shirts) they distribute at those out-of-date, pipe-and-drape trade shows, and more on investments in understanding. I'm a futurist first, but I'm also a realist. Vendors appear doomed to always overspend on the trivial and leave the hard work of figuring out how to use technology to make money and create mission value to the folks in the trenches.

Bear in mind, though, that while IT may not suck at long last, that won't last for long. Change is upon us. Is your organization prepared for the disruptions associated with the "SMAC stack" — the mix of social, mobile, analytics and cloud? Have you adjusted your talent pipeline? Have you put in place the appropriate risk-adjusted "experimentation sandboxes" to gain experience with these technologies ahead of deploying them at scale? Have you created a network of smart people doing smart things on the edges?

Of course, in the history of computing, enterprise IT has rarely *ever* been prepared for the future. Think about it. Were we ready for the PC, client/server or the Web? Decidedly not. But we can't go on that way.

H.G. Wells planted the seed for modern futurism with a series of essays called "Anticipations," in which he advocated that thinkers/actors in the present should devote substantive cognitive resources to shaping the future. I think he was right. •

Thornton A. May is author of *The New Know: Innovation Powered by Analytics* and executive director of the IT Leadership Academy at Florida State College in Jacksonville. You can contact him at thorntonamay@aol.com or follow him on Twitter (@deanitla).

Providing Insight into Your Data Center Operations While Increasing Energy Efficiency

TODAY, IT IS INCREASINGLY DIFFICULT TO MANAGE DATA CENTERS and extended enterprise sites as they grow in scale, density and complexity to meet increasing business demands. Budget constraints coupled with manual processes and audits make optimizing IT assets and resources a daunting task for data center and facilities professionals.

Amid this complex environment, the critical operational management challenges facing data center and facilities professionals include ensuring resilience and uptime, optimizing physical capacity and IT assets, and balancing increasing power requirements with rising energy costs.

The implications of increasing energy efficiency in the data center are significant and far-reaching, compelling data center managers to grapple with the rigors of compliance and improve power usage effectiveness (PUE) metrics to lower operating costs. With a PUE start point of 1.0 indicating maximum energy efficiency, the majority of data centers are currently operating at well above 2.0, which would indicate there is still considerable room for improvement.

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Panduit Intelligent Data Center Solutions include a combination of services, software and hardware products that yield an optimized physical infrastructure. These elements work together when you are designing a data center, to ensure maximum energy efficiency and continued visibility for ongoing optimization.

A key element of our solution is the Panduit SmartZone™ Infrastructure Management Software that aggregates real-time asset and connectivity data with power and energy management insights. Panduit SmartZone™ Solutions empower you with valuable infrastructure information. Armed with this information, data center and facilities management can work together to create optimization strategies to improve energy efficiency by 10 to 30%.

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Panduit recently helped a large storage technology company deploy a comprehensive solution to optimize its data center operations. The company utilized a Panduit Thermal Assessment and Optimization Service and then deployed a Panduit Intelligent Data Center Solution consisting of Net-Contain™ Cold Aisle Containment System and Net-Access™ Cabinets. The Panduit® Net-Contain™ System now allows the company to cool with 20% less airflow, which results in a much smaller volume of air to maintain its current set point, regardless of incoming building air, yielding tangible energy savings.

SMART MONITORING TO SUPPORT ENERGY EFFICIENCY

A major U.K. retailer enlisted Panduit which employed its 6 Zone™ methodology to create the foundation for a data center and enterprise-wide monitoring consolidation program. By leveraging the Panduit pioneering 6 Zone™ infrastructure methodology for assessment, plan/design, integration and operation, SmartZone™ Solutions can be deployed to provide a holistic view of connectivity, energy and environmental parameters in the data center and extended enterprise. This can help to immediately improve operational and energy efficiencies, achieve rapid and significant cost reductions, and improve overall facility performance, with the intention of helping you align with corporate energy initiatives

The retailer employed this methodology in its new and legacy data centers, initially focusing on instrumenting Zones 4–6 (branch circuit PDU monitoring, through to cabinet- and device-level monitoring) to provide the level of granularity required to support a sustained energy efficiency program. The client has now standardized this methodology with SmartZone™ instrumentation to provide power and environmental intelligence across all of its new data centers. ■

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EDITOR'S CHOICE AWARDS

WHAT'S THE VALUE of a single piece of customer, patient or research data? How about several billion pieces of such data? The 12 winners of *Computerworld*'s first-ever Data+ Editor's Choice Awards were well aware that they sat on gold mines of information. And each in its own way turned a massive data repository into solid business results. A top-tier healthcare organization, for example, added $62 million to its bottom line, and a world-renowned university gave its research scientists a big boost as they worked to develop next generation solar power cells. Read on to learn how those organizations and the other 10 honorees are making innovative use of big data and taking full advantage of new technologies to set the pace in the field of business intelligence ◆

EDITOR'S CHOICE AWARDS

The Quintiles big data and advanced analytics team (clockwise, from front left) Joseph Goodgame, Gavin Nichols, Kris Gustafson, John Poonnen and Tim Clayton

[illegible]

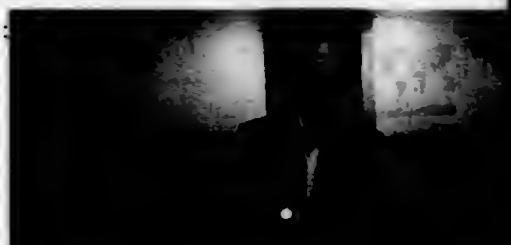
By Sue Hildreth

DEVELOPING A NEW DRUG can cost millions of dollars and take upwards of 10 years to reach the market. The quicker a pharmaceutical company gets a product to market, the less time and money it spends on R&D and the faster it can begin to turn over its investment. Technologies that help companies track potential and more quickly analyze its results can have a huge impact on the bottom line. [illegible] knows that firsthand. The $4.8 billion company [illegible] research and services to the pharmaceutical industry. [illegible] other things, Quintiles plans and monitors clinical trials, recruits patients for trials and submits [illegible] regulatory agencies. For the past few years the [illegible] Massachusetts company has worked to create an [illegible] software modules to handle all phases of [illegible] development. Its [illegible] solution integrates the data and [illegible] analytics it gives the [illegible] and provides [illegible] and [illegible] data for analysis [illegible] combined with [illegible] research data and [illegible] the software to provide predictive analysis [illegible] integrated with [illegible] solutions such as those from Oracle, SAS, IBM, Salesforce Enterprise Edition, Siebel CRM [illegible] SAS Analytics, Microsoft SQL Server and Informatica. Master [illegible] management system as well as Hitachi Specific [illegible] and existing [illegible] systems. Matt [illegible] the [illegible] [illegible] helps [illegible] the data operations [illegible] [illegible] [illegible]

Procter & Gamble

Executives navigate global markets with BI visualization.

By Sue Hildreth



Filippo Passerini, CIO and president of global business services at P&G, in one of the company's Business Spheres.

EXECUTIVES AT consumer goods giant Procter & Gamble, which owns 300 brands sold worldwide, must constantly make important decisions on business issues ranging from branding strategies to supply chain management.

A bad decision — one based on outdated information or inadequate analysis — could cost the company millions in wasted spending or lost sales. But until recently, business analysis was conducted mainly by sifting through stacks of printed reports and electronic spreadsheets.

So in 2008, P&G's Global Business Services organization began shopping for business intelligence software. The goal was to give decision-makers an easy-to-use BI tool and access to near-real-time data so they could do predictive analytics and answer "what if" questions. Another objective was to find a system that enabled people in P&G offices all over the world attend the same meetings and view the same data.

"Senior executives had been limited to running the business by looking in the rearview mirror, and we wanted a forward-looking focus with better speed and quality of the decision-making," says Alan Falkingham, the director of business intelligence and analytics at P&G.

The BI initiative resulted in the construction of futuristic meeting rooms that P&G calls Business Spheres: oval conference rooms with white walls equipped with two 32- by 8-foot screens capable of displaying charts, graphs, heat maps and other visuals. P&G analysts use Tibco's Spotfire BI tool to study data and put together reports that they present to managers in meetings in the Spheres. Spotfire can drill down into areas of interest to attendees or create "what if" scenarios to illustrate the results of different strategies.

Doreen Bayliff, vice president of P&G's North America oral care business, says she and her leadership team use the Sphere two or three times a month to keep on top of market trends. "We use data in real time to monitor the health of the business externally versus the competition," says Bayliff. "The Business Sphere helps us make more holistic and agile decisions." ◆

Using data analysis and visualization tools, one P&G business unit reduced inventory in its supply chain by 25% and saved millions of dollars.

DATA

EDITOR'S CHOICE AWARDS

The Quintiles big data and advanced analytics team (clockwise, from front left): Joseph Goodgame, Gavin Nichols, Kris Gustafson, John Poonnen and Tim Clayton.

Quintiles

Big data analysis cuts costs, time to market for pharmaceuticals.

By Sue Hildreth

DEVELOPING A NEW DRUG can cost millions of dollars and require years of research. The quicker a pharmaceutical company gets a product to market, the less time and money it spends on R&D and the faster it can begin to earn a return on its investment. Technologies that can speed up a drug's trial period and more quickly analyze its odds of success can have a huge impact on the bottom line.

Quintiles knows that firsthand. The $4.8 billion company provides clinical research services to the pharmaceutical industry. Among other things, Quintiles plans and monitors clinical trials, recruits patients for trials and submits materials to regulatory agencies. For the past four years the Cambridge, Mass.-based company has worked to create an integrated suite of software modules to handle all phases of drug research, development and trials.

Its software platform, Infosario, integrates the data and processes associated with a drug's life cycle and includes a data engine to collect, clean and prepare data for analysis. The data can be combined with clinical research data and information from other sources to provide predictive analysis.

Formally launched in 2010, Infosario uses elements from Oracle Business Intelligence Enterprise Edition, Siebel's CRM system, SAS Analytics, Microsoft SQL Server and Informatica's Master Data Management system, as well as Tibco's Spotfire data discovery and visualization tool. At its core is the Quintiles Data Factory, which contains the data operations and collection tools for extracting and organizing clinical and operational data from other repositories.

An executive at a Quintiles customer, a major pharmaceutical company, notes that the traditional method of planning a drug trial involves examining data from prior trials to develop the best approach. Infosario allows the company to design drug trials more quickly and effectively. ◆

Hildreth *is a veteran IT writer in Waltham, Mass. She covers enterprise technologies, from BI and CRM to social media and IT management.*

Procter & Gamble

Executives navigate global markets with BI visualization.

By Sue Hildreth

Filippo Passerini, [illegible] and president of global business services at P&G, in one of the company's Business Spheres.

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ROI »

The Quintiles Infosario system allows researchers to revisit decisions made earlier within the same drug trial. That's a big benefit, says Quintiles CIO Richard Thomas, because clinical trials take six seven years, so feedback loops collect lot of data [illegible]

Intel

A security platform built for big data parses more than 1 million events per second.

By Mary K. Pratt

Ajay Chandramouly, a member of Intel's big data solutions team

FOLLOWING TWO security lapses several years ago, Intel executives pushed for an information security overhaul. But at a company with more than 100,000 employees in 63 countries, deploying a system capable of detecting, reporting and responding to suspicious activity meant gaining insight into a massive enterprise IT architecture — and that was a big challenge.

So Intel used big data technologies when it built its Security Business Intelligence (SBI) platform. A key component of the company's "Protect to Enable" enterprise security strategy, the SBI system collects, aggregates and analyzes data from all corners of the enterprise as it keeps an eye out for things like unauthorized data transfers and advanced persistent threats.

"We have a big data environment, so we had to design a solution to accommodate that," says enterprise architect Stacy Purcell.

ROI »

Intel won't disclose how much it spent on the SBI platform, but enterprise architect Stacy Purcell says its capacity for identifying suspicious activity enables the security team to respond to threats rapidly.

DATA+ EDITOR'S CHOICE AWARDS 2013

Michael Suby, an analyst at Frost & Sullivan, says many large organizations are using big data to improve their IT security. "Conceptually, it should help Intel in fortifying their environment, identifying threats as they're occurring and mitigating those threats," he says.

Deployed in 2012, the SBI platform uses a combination of custom-built and off-the-shelf hardware and software to collect, store and analyze data from servers, databases and other systems.

A common logging service collects and parses event and contextual data at a rate of more than 1 million events per second; it also supports report generation and workflow automation.

The SBI platform has advanced analytics functionality, making it possible to drill down into selected anomalies to make inferences that help investigators to identify the cause of abnormal activity.

With an average of more than 6 billion new logged events a day, Intel's team of operations, engineering, architecture and privacy experts needed tools that could handle the volume easily enough to contain and remediate threats in a timely manner.

"Without this capability, we couldn't even answer basic question like, 'How big a problem is X in our environment?'" Purcell says. "It's game-changing for us in that we can create solutions in response to risks." ◆

Pratt *is a Computerworld contributing writer in Waltham, Mass. Contact her at marykpratt@verizon.net.*

DATA+ EDITOR'S CHOICE AWARDS

LiveRail

By Mary K. Pratt

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JWB team members Michael Warner, Lisa Sahulka and Laura Peele.

Pinellas County Juvenile Welfare Board

gives more assistance with fewer dollars with BI. By Sue Hildreth

FIVE YEARS ago, the Pinellas County Juvenile Welfare Board (JWB) was facing a budget shortfall. A meltdown in real estate values had diminished the property tax revenue that the Clearwater, Fla.-based agency depends upon for funding. So the JWB developed a BI initiative to assess the value of each program it offers.

"The downturn in the economy was catastrophic to our budget. We needed to know the best use of our money," explains Michael Warner, the JWB's lead technology analyst.

The JWB selected Roombi's business intelligence tool, in large part for its ability to provide a user-friendly BI and reporting layer that would encourage nontechnical JWB staffers to use it, says Warner.

Data from community programs that the board funds is put into the JWB database, as is data from outside sources such as the juvenile justice system, census records, street maps and school records. Because most of that data was already entered into the JWB's systems, integration wasn't a major challenge.

In fact, the biggest challenge was narrowing down the list of metrics and parameters to track, says Warner. Each review and trial of the system spurred the JWB staffers to think of more things they wanted to know, so questions began to multiply.

"Our questions kept changing," he notes. "Using BI can be very transformative."

Among other things, that process led to the development of an index to measure program successes vis-à-vis various factors that put children at risk for dropping out of school.

ROI » **LiveRail's initial investment of $20,000 to $30,000 during the first year included ramp-up and deployment, and although the company doesn't bill customers for the analytics-powered reports, CTO Andrei Dunca says the fact that the reports are available helps attract and retain customers.**

JWB team members Michael Warner, Lisa Sahulka and Laura Peele.

Pinellas County Juvenile Welfare Board

A Florida youth welfare agency gives more assistance with fewer dollars with BI. By Sue Hildreth

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ROI » The system showed that early childhood learning programs save the county about $6,179 per student per year. Also, the JWB found 2,032 children to add to its school preparation programs.

One metric that's tracked is the number of children who can't read at or near a third-grade level by third grade, because reading level at an early age has been found to correlate with the likelihood of incarceration later in life, says Warner.

To make it easier for nontechnical JWB professionals to use the system and understand the data and trends, a visual analysis tool from SpatialKey was added. With it, users can, for example, create heat maps that highlight populations of high-risk kids and identify possible contributing factors, such as distance from recreational facilities.

"Now we're using the data to paint an incredibly accurate picture of at-risk children and families in Pinellas County," says Ben Kirby, communications manager for the JWB. "This allows the board to make informed decisions." ◆

Novation

EDITOR'S CHOICE AWARDS

Members of the Novation team (from left): Howard Bolton, Guillermo Ramas, Tim Vander-Molen, Hari Subramanian and Mike Ruetten.

M EDICAL SURGICAL

Collett

Ingram Micro

BI automation boosts renewals of support contracts for IT equipment.
By Sue Hildreth

IN A tight economy, every sale counts, even the small ones. That's particularly true for the 3,700 North American resellers that provide service to the customers of $38 billion Ingram Micro, a global IT distributor and a Fortune 100 company.

The resellers provide the first line of contact and support to users of everything from Apple iPads to IBM servers and Cisco networking equipment. But renewing a service contract is a time-consuming task, and account reps can't easily track every contract nearing its expiration date.

Two years ago, Ingram executives became concerned that many of the company's smaller customer contracts were expiring more frequently than those of its large customers. The reason was obvious: Salespeople tended to put more time into renewing the higher-priced service contracts, which carry higher commissions.

ROI

For Ingram Micro, a new contract renewal system powered by business intelligence delivered more than $220 million in automated quote opportunities to resellers each quarter and resulted in a 135% increase in revenue from renewals.

However, the small contracts — $25,000 and under — accounted for 95% of Ingram's SMARTnet support customers. So the cumulative value of those "small" contracts was by no means small. Moreover, failure to renew a contract in a timely manner could lead to a permanent loss of business.

Enter MaintenanceNet, a Carlsbad, Calif., company that provides IT services to automate the handling of contracts. MaintenanceNet tapped into Ingram's enterprise systems and data, as well as those of its reseller partners, and set up a contract renewal process that pulls data from the ERP and CRM systems, product catalogs, pricing documents, and point-of-sale, ordering and transaction systems, and then identifies expiring contracts, verifies product and service availability, and emails everything to the appropriate reseller 90 days before the expiration date.

Tom Sweeney, an analyst at ServiceXRG, a consulting firm that helps companies develop and execute service strategies, says this approach optimizes revenue from a large number of contracts without an excessive investment of human or technical resources.

"I'm not going to sell a 3-cent service contract on every pencil that I sell if it's an intensive process," says Sweeney. "But if it's automated, all of a sudden you generate a whole lot of incremental revenue without throwing a bunch of bodies at it." ◆

Catalist

In the closest congressional races, data makes the difference. By Stacy Collett

SEEKING A COMPETITIVE EDGE in 50 hotly contested congressional races in 2012, the Democratic Congressional Campaign Committee turned to Catalist, a Washington-based political consultancy that uses dynamic modeling of voter information to develop campaign strategies.

Catalist built the DCCC dynamic models

DATA+
EDITOR'S CHOICE

that uploaded daily survey results and field information and combined it with existing data on 190 million registered voters and 90 million unregistered voters. It had 700 data elements on each person. Every night, highly tuned models for each race used that data to create action plans for the next day.

"It told them whose door to knock on," says Catalist COO Gayatri Bhalla. "We were able to figure out who is newly registered and where they fell on their partisanship score or their ideology score" — metrics that are based on the history of donations people make to causes or candidates, petitions they have signed or online surveys they may have taken. By building rich profiles with that data, "we're able to predict with a high degree of accuracy which way a voter will lean," she says.

Catalist gets most of its 2 petabytes of data from the offices of secretaries of state around the country. It's allowed to access that information because "we do not serve a commercial enterprise, and we don't operate for profit," says Bhalla, explaining that many states prohibit the use of such data for commercial purposes.

Among other things, Catalist's analytical tools can "match" multiple names to a specific person. "We can figure out that Bobby Jones is the same as Robert Jones and Robert L. Jones, but different from Robert S. Jones," Bhalla explains.

In data analytics, it's important to remember that "not all data is created equal," says Bhalla. "You can have the best tools, but it's garbage in, garbage out." ◆

Catalist's data analysis proved to be a powerful resource for the DCCC in 2012. Of the 50 races targeted by the DCCC, Democrats won 30, including eight of 10 races decided by 2 percentage points or less.

Constant Contact

Email marketing that gets a lift from big data analytics.

By Stacy Collett

HOW DOES a small business get noticed when its promotional emails barely stand out in a sea of ads that flood consumers' inboxes, just one click away from the spam folder?

Constant Contact aims to answer that question. The Waltham, Mass.-based company uses tools such as IBM's InfoSphere BigInsights to analyze data in an effort to help small businesses develop more successful email marketing campaigns.

"We've looked across our massive data set to understand what behaviors make our customers most successful," says Jesse Harriott, chief analytics officer. "For example, we've looked at open rates, and we can tell a B2C customer the best time to send their emails to get the optimal open rates. That time might be very different for a B2B customer in a different industry."

Another example is analyzing specific campaigns and determining what types of content drive the most customer engagement, says Harriott. "A 20% off deal might be a great fit for a restaurant, while a consultant may be more interested in receiving a white paper," he notes.

Constant Contact collects data from more than a half-million customers to whom it sends billions of emails every year — as many as 45 billion in 2012. That scale lets the company gain insights and study trends, including everything from how open rates differ based on the time an email was sent to what kind of content gets the most clicks based on industry.

"While we've had all this data for a long time, it hasn't been until fairly recently that we've truly been able to mine real insights out of it," says Harriott. "The volume actually worked against us until we had the tools that allow us to analyze our massive data set cost- and time-efficiently."

"Our small business customers simply don't have the time, scale or resources to examine big data," he adds. "It's another way we can add value for them." ◆

ROI »

Constant Contact deployed its analytics tools in November 2012, and customers are already seeing 15% to 25% improvements in the performance of their email marketing campaigns. The tools also reduced the company's analysis time from hours to minutes.

» Stefan Piesche

» Jesse Harriott

By Stacy Collett

Express Scripts

Members of the Express Scripts team (from left): VP and CTO Jim Lammers; Sr. VP and CIO Gary Wimberly; Glen Steftin, M.D., Sr. VP of clinical, research and new solutions; Brian Seitz, VP of clinical and specialty solutions.

ROI

BI platform helps doctors and patients find lower-cost medications. **By Stacy Collett**

Express Scripts

Members of the Express Scripts team (from left): VP and CTO Jim Lammers; Sr. VP and CIO Gary Wimberly; Glen Steelin, M.D., Sr. VP of clinical, research and new solutions; Brian Seiz, VP of clinical and specialty solutions.

PATIENTS WITH complex health conditions such as cancer or multiple sclerosis can spend $6,000 to $100,000 per year on "specialty" prescriptions, which aren't covered by traditional prescription drug plans but by more complex and unmanaged medical insurance plans.

St. Louis-based Express Scripts wants to take a bite out of those astronomical costs by combining its pharmacy knowledge with extensive data it collects from its patients to find the best medications for each patient and the lowest possible prices. What's more, its ExpressPath platform can manage 100% of a client's drug costs regardless of whether the medications are covered under the patient's pharmacy or medical insurance plan, a feature not previously available in the healthcare industry.

Physicians connect to the platform through a portal that can be accessed via a mobile device or desktop and can determine how much a prescription will cost before the purchase.

"Physicians are able to see all the other conditions and prescriptions on this patient," explains Gary Wimberly, senior vice president and CIO at Express Scripts. "[The system is] able to interact with them [to determine] the right medication and the right channel — whether through a clinic, home infusion or specialty mail-order pharmacy. It optimizes both the care for the patient and the medication."

"It gives our providers unlimited access to getting authorization requests," even at night and on weekends, says Melinda Pollard, manager of pharmacy operations.

"We're attacking $8 billion a year in wasted specialty [spending]," Wimberly says. "If we get true adoption, we can drive $8 billion a year out of the healthcare system." ◆

Vanguard

Robust analytic capabilities add $62 million in new revenue. By Mary K. Pratt

Vanguard Health wouldn't disclose the company's investment in its IDology project, but officials say that it has helped generate $62 million in new net revenue since its 2012 launch, and they expect further new revenue growth in the future.

EXECUTIVES AT Vanguard Health Systems wanted the Nashville-based healthcare organization to grow — but knew they didn't have the insight into current or potential customers to make it happen.

So in late 2011, following the arrival of a new chief strategy officer and a new chief marketing officer, Brian Barnes and his team set out to gather and analyze the data required to gain that insight.

"We wanted to know: How do you solve the problem of not knowing why people are coming to your facilities, or why not? Looking at the data [allows us] to figure out who we should even talk to," says Barnes, who is Vanguard's vice president of growth and innovation.

Vanguard also wanted to foster a stronger digital presence. "We needed to take advantage of the latest Web technologies, because we weren't leveraging our Web footprint to leverage our brand," Barnes says.

To achieve those objectives, in late 2012 the organization launched the Vanguard Health IDology platform. The platform includes CRM analytics, Google analytics and search engine optimization, Web and mobile content management, and appointment-scheduling software. It identifies target populations for Vanguard's marketing efforts, including online campaigns.

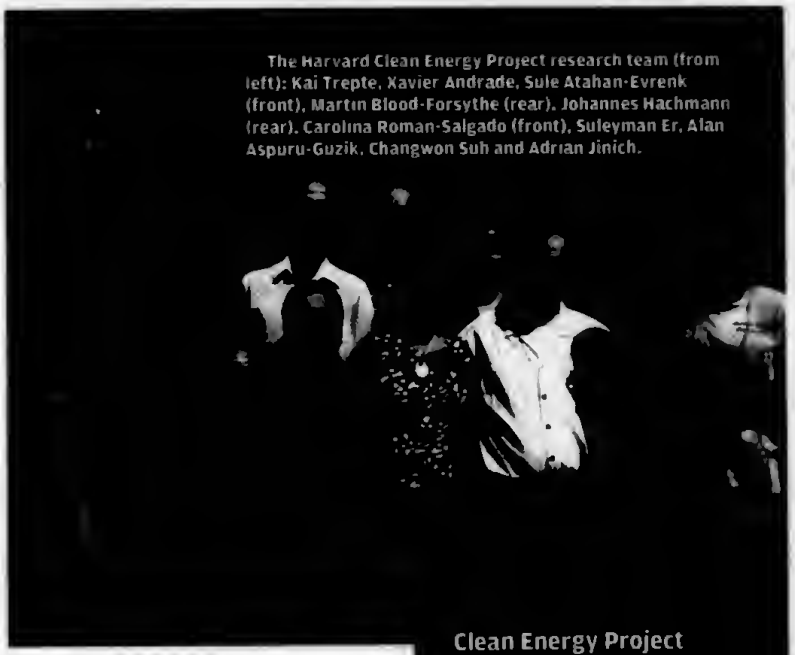
Holger Mueller, an analyst at Constellation Research, says many organizations are still learning how to unlock the value of the information they have. "Everyone knows there's value in the data, but they don't know if their investment in it will yield results," he says.

Barnes says the challenges his team had to contend with included figuring out how to ensure the availability and verify the quality of multiple data streams. Support from the chief marketing officer and the chief strategy officer was instrumental in pushing his team forward.

The result has been much more focused marketing initiatives that have brought in $62 million in new revenue. "We wanted to make sure we target the right person," says Barnes, "and now we can because it's all backed up by data." ◆

Harvard University

Computing grid speeds data sharing among scientists studying clean energy. By Mary K. Pratt



The Harvard Clean Energy Project research team (from left): Kai Trepte, Xavier Andrade, Sule Atahan-Evrenk (front), Martin Blood-Forsythe (rear), Johannes Hachmann (rear), Carolina Roman-Salgado (front), Suleyman Er, Alan Aspuru-Guzik, Changwon Suh and Adrian Jinich.

PHOTO: JOSEPH GOODKNIGHT

HARVARD UNIVERSITY professor Alan Aspuru-Guzik and his team are supporting the search for organic compounds that could be used in the next generation of solar power cells.

To date, Harvard's Clean Energy Project has studied 2.3 million compounds and accumulated 500 terabytes of molecular data.

A massive undertaking, for sure, but Aspuru-Guzik's team has it covered. They tapped into the IBM World Community Grid — a distributed platform that uses the spare processing power of about 6,000 computers made available by volunteers around the world — to perform quantum chemical calculations on millions of organic materials.

This approach allowed the researchers to perform in three years, from 2010 to 2013, calculations that would have taken 17,000 years on a single computer.

The calculations determine which compounds are most promising for use in solar power cells. All 2.3 million compounds are ranked from most promising to least based on those computations, Aspuru-Guzik explains.

Results are kept in a system of large data storage arrays known as "Jabba." Based on a design by Backblaze, each array in Jabba utilizes 45 3TB hard drives from HGST, a Western Digital company.

The technology allows the team to share data on materials with other researchers on an unprecedented scale. The sharing occurs through a portal called Molecular Space (at *www.molecularspace.org*).

Aspuru-Guzik says his team can provide raw data to researchers who request it. Those researchers can then search for compounds based on, for example, specific properties, or they can plug in specific data to make predictions about particular molecules.

"It's an extremely valuable data set, and it has the potential to push us years ahead," says Marcus Hanwell, technical leader at Kitware, a Clifton Park, N.Y.-based company that makes and supports open-source software frequently used by researchers.

Hanwell says the CEP's analysis helps other researchers avoid going down "blind alleys" and spending months or even years researching compounds that ultimately won't yield results.

Kitware is collaborating with the Clean Energy Project to develop software tools that help researchers analyze the data.

At the same time, Kitware is using the data set — one of the largest that is open for such use — to develop open-source software and simulation code that could benefit researchers in general.

"There are all these secondary benefits you can get with a large data set that's open for the community," Hanwell says. ◆

> Clean Energy Project researchers won't disclose the technology's cost, but they say the payback is its contribution to making plastic solar cells a viable option for the cheap and versatile production of renewable energy. The new technology could bring electricity to an estimated 2.5 billion people.

Security Manager's Journal

MATHIAS THURMAN

Trouble Ticket

Data Classes Meet Real World

Company's policy on restricting data was sometimes too rigid, so a new category is born.

THE DATA CLASSIFICATION policy that I introduced a couple of years ago has served the company well, but now the global architecture team has pointed out its limits.

We have three classifications: Restricted, Confidential and Public. The problem is that only the Public classification allows for any possibility of data being shared with anyone outside of the company. That inflexibility doesn't work very well in the real world.

The global architecture team is responsible for reviewing all enterprise applications. They do that using a strict set of questions and requirements, including the applications' compliance with tbe data classification policy. There have been some mismatches in that area. For example, the sales organization wanted to deploy a mobile application that is capable of rendering executive reports on sales forecasts. According to our classification system, anything related to sales forecasting has to be classified as Restricted. That means a user wanting to use that mobile app would need to VPN into our network, which is an overly cumbersome restriction in the minds of some of our executives.

And it's hard to argue that "rules are rules" when we don't enforce the same controls equally for other data that has been classified as Restricted, such as pricing lists.

It isn't just that one mobile app for the sales group that seems problematic. Another example is a mobile app that lets users view their HR records and managers approve time-off requests, among other things. Because the app can access sensitive HR data, such as Social Security numbers and salaries, it should also be treated as a repository of restricted data. But that undercuts the app's utility a good deal.

computerworld.com/blogs/security

Though I resisted the idea at first, the architecture team was able to convince me to create a fourth data category. Under the new plan, we will classify as Restricted only that data that, if lost or compromised, would represent grave loss to the company. Confidential data will be deemed as unsuitable for public disclosure as well, but the consequences of its compromise would be less dire, and the restrictions are less stringent. The new category, which is as yet unnamed, will be for data that should not be made public but may be accessed in ways that aren't always highly secure. One consideration is that the aforementioned HR app, for example, could reveal someone's Social Security number, but it could never reveal *everyone's* Social Security number. Another candidate for the new category might be a customer knowledge base. It wouldn't be a loss to the company if knowledge base information were disclosed, but we still make it available only to our customers.

> **It's hard to argue that 'rules are rules' when we don't enforce the controls equally.**

Enter the Matrix

We have also created a matrix for evaluating new applications that weighs methods of access against the need for restriction. For example, our Sarbanes-Oxley-protected financial application will remain Restricted, meaning that access can only be from a company asset and on the corporate network. In the case of cloud-based applications classed as Restricted, we will limit access to company IP address ranges, and will also require that tbe data be encrypted both at rest and in transit. It's extremely important that we set guidelines for cloud-based apps, since the company continues to look at the cloud first whenever we think about starting to use a new application or replacing an existing one.

Now that we have defined our new data classification, we will have to name it. But more importantly, we need to get buy-in from legal and HR. Then we'll modify our policy documentation and security awareness training materials, which are always necessary steps when a policy is modified. ◆

This week's journal is written by a real security manager, ***"Mathias Thurman,"*** *whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com.*

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SENSAPHONE

Career Watch

Could quality assurance be the happiest job in IT? If you believe the folks at online jobs site CareerBliss, it is that and more – with senior QA engineer ranking as the second happiest job *in existence*.

CareerBliss loves to crunch the data that's supplied by the folks who submit information to it. It's a self-selecting group, of course, and a relatively small sample, to boot. Its rankings of the happiest jobs in America, for example, are based on some 65,000 job reviews it received over the course of 2012. That might seem like a good-size number, but it covers hundreds of jobs. In determining the happiest jobs, CareerBliss set a minimum of 50 reviews for a job to be included. And your CIO just might be a lot happier than the folks over in QA for all we know; no executive-level jobs were included at all.

In other words, the CareerBliss data is solid enough to be interesting, but not solid enough to stake one's life – or career – on. That said, what can explain the happiness of QA professionals?

They're well paid, with the average QA worker who submitted a review to CareerBliss making $82,000. But pay is only one factor and not enough to explain the relative happiness of those folks. In fact, the absolutely least happy job in America, according to CareerBliss, is associate attorney, which also happens to have the highest average salary of all the jobs included in the rankings ($111,000). But the site considers other key factors that affect work happiness, including work/life balance, relationships with bosses and co-workers, work environment, growth opportunities, and company culture and reputation. CareerBliss CEO Heidi Golledge told *Forbes* that while the QA job involves long hours and intense demands, senior QA engineers are gratified to feel that "they are typically the last stop before software goes live and correctly feel that they are an integral part of the job being done at the company."

In contrast, tech support specialists don't seem to feel quite so gratified. They ranked as having the ninth least happy job in America. But IT overall is a happy place to work, with three positions landing in the top 10. (See list at left.)

The Happiest Jobs in America
1. Real estate agent
2. Senior QA engineer
3. Senior sales representative
4. Construction superintendent
5. Senior application developer
6. Logistics manager
7. Construction manager
8. Executive administrative assistant
9. Network engineer
10. Assistant controller

ASK A PREMIER 100 IT LEADER

Vince Campisi

The CIO at GE Intelligent Platforms answers questions on **age and IT careers.**

I am a registered nurse transitioning to IT security. I am in my 50s, so I can't afford any missteps. What education and certifications would be the best and quickest route to a top IT security position? Information security professionals have a wide variety of backgrounds, and many do not have technical degrees. I have worked with great people with backgrounds in fields such as psychology and history, for example. But we are now seeing graduates with college degrees in fields such as cybersecurity and risk analysis. Many employers are looking for this type of degree and/or a certification. My advice is to get involved in information security organizations and participate in industry conferences. This will help you establish contacts and become more familiar with IT security in general. Additionally, community colleges that offer courses in IT security are an alternative to pursuing a dedicated degree. Lastly, be sure to target the right type of positions for your first job; for example, access management is less technical in nature and can help you segue into a career in IT security.

After serving in Iraq, I went to school for a computer science degree. I will be 29 when I graduate. Will my age hurt my chances in the job market, and if so, how can I offset that? First, thank you for your service! I am confident that the leadership, integrity and commitment to excellence instilled through participation in military service will be important career differentiators for you. Those qualities, coupled with your computer science degree, should serve you well in your job search. In fact, you will find that most companies (including mine) have targeted efforts to recruit veterans, and they do this precisely because of those differentiating skills learned through military service.

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Quantitative Analyst (Mountain View, CA) #1615.3795 Research methods for improving Google technology. Exp incl: Matlab, C, C++, SAS, & SQL; optimize theory; dimension reduction algorithms for modern, massive data analysis, high-dimen spatial data analysis; stat analysis, app of adv analytics in mrkting research, impact analysis, revenue recognition, risk mgmnt, pattern analysis, & trend forecast through regression models & time-series models; & theoretical math & stat.
Software Engineer Positions (Mountain View, CA): Design, develop, modify, and/or test software needed for various Google projects. Exp incl: #1615.2911: prod requirement analysis, syst arch design, tech leadership of prod requirement definition & prod design; & prog modules. #1615.1845: Java, C++, or Python; data struct, algorithms, & distrib comp; large-scale web application dvlpmnt; design scalable sw sys, & mach learn algorithms, prog lang theory, & internet & oper sys. #1615.6758 design & implement consumer-fvl applications, Java or C#; C, C++, STL, Python, & Matlab; RPC, SQL, HTML, Jscript, & CSS; NoSQL large scale databases; algorithms &parallel prog; Eclipse IDE, GNU toolchain & Linux syst; dvlpmnt of full-stack data visualization syst; implement & debug multi-layer real-time ntwrk-connected syst; unit test; funct test, & com'l integration test, design & implement multi-thread web & mobile apps; & design of distrib syst & databases. #1615.2117 design, debug, & perf tuning of large scale distrib syst; C &/or C++; & Python, HTML, &/or Jscript; large-scale data index; & HTML lexer &/or parsing syst; #1615.7066 Java or C++, Linux, Jscript, HTML, Python, & SQL; code audits, black box test, & privacy design review of prod & srvcs, anonymization techniques, applied cryptography, ntwrk security, large-scale distrib syst design & arch, & design patterns; & privacy research & design analysis. #1615.2591 ntwrk; C++; multithread apps, troubleshoot cust facing online web-scale syst; monitor of real-time critical app; info retrieval syst & nat lang process, design & dvlpmt of large-scale distrib syst; & dvlpmt pipelines. #1615.5661: Java or C++, design & implement complex, multi-thread algorithms & large-scale data struct; & design, implement, & oper of large-scale complex sw syst. #1615.6187: Java or C++; design & implement complex, multithread algorithms, & large-scale data struct, design, implement, and oper of large-scale complex sw syst; monitor syst & scale; OOP; debug to isolate & fix bugs & perf issues; write unit & funct tests to ensure complete code coverage; & algorithm design & implementation & analysis of runtime & memory requirements. #1615.4450 C++ or Java, writing automated unit tests using frmwrks, incl JUnit & Mockito, Python, Unix or Linux; multithread, TCP/IP; & distrib syst prog. #1615.9081 C++, Python, Bash, & Jscript; MapReduce; web search index & srvr syst; distrib syst; & data struct & algorithms.

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Software Engineer Positions (Mountain View, CA): Design, develop, modify, and/or test software needed for various Google projects. Exp incl: #1615.424 design parallel, scalable, robust distrib sys w/ fault tolerance, consistency, & avail guarantees, large-scale data process syst; Python & cluster mgmnt sys; C; design oper sys, shell script & Linux commands, OOL/relational databases & SQL; design, implement, test, troubleshoot, & maint comp subsyst & prod syst; code editors & revision control syst; core web tech, multithread & RPC syst; & online ads. #1615.6491 highly avail distrib syst; design, implement, test, & maintain sw subsyst; Java, Jscript, C++, or Python; data struct & algorithms; front-end design, dvlpmnt, & dplymnt, & HTML, CSS, Jscript, Ajax, & GWT. #1615.6500 large-scale distrib data process; nat lang process, stat mach learn; optimization algorithms; & high-throughput srvr code in C++. #1615.2979 C++; dvlp large-scale syst; maint large-scale syst; debug & tuning low-lvl syst details, & dvlpmnt of ranking algorithms for web searches. #1615.3957 C++, data analysis; multithread, MapReduce or Hadoop; ntwrk perf monitor & test; & mach learn.

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Software Engineer Position (Boulder, CO) Design, develop, modify, and/or test software needed for various Google projects. Exp incl: #1615.4750 drive SDK, XML, perf in release cycle; Java; SQL, Oauth; distrib syst arch, & perf optimization.

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Test Engineer (Mountain View, CA) #1615.3772 Design, develop, modify, and/or test software needed for various Google projects. Exp incl: client & srvr app test; UI test; API/SDK test; database mgmnt; web srvcs test; end-to-end automation using Junit, Python, & Perl scripts; compatibility test w/ OS & browsers; & code resource & version control syst;
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Software Engineer Positions (Mountain View, CA): Design, develop, modify, and/or test software needed for various Google projects. Exp incl: #1615.6068 C++, Java, or Python; OO sw design, unit test HTML, CSS, & web-based sw design, datastruct; multithread; & OS fundamentals. #1615.443 C++ or Java; OOD & prog, distrib syst; UI dvlpmnt; AJAX, HTML, CSS, OO Jscript; & cross-browser web app dvlpmnt. #1615.853 Java, Python, C & C++; funct prog, multithread, graph algorithms, & dynamic prog; & static prog analysis & verification; compilers & compiler optimizations; perf analysis; & distrib syst & large-scale parallel data process. #1615.864 C++ & STL, Java or Python; SQL; Linux; large scale syst design, & parallel & distrib compute. #1615.6793 Java, Jscript, C, or C++; API use or design, web authenticate & authorization or security standards; large scale syst design, dvlpr workflow & tools; & Cloud tech. #1615.5556 app dvlpmnt using C++, Java & Jscript; client & srvr app dvlpmnt large-scale data process; scriptwrite in Linux environ; & dvlpmnt of native Android app w/Android SDK & OpenGL. #1615.1472: C or C++, Python, math & stat comp sw packages; algorithm & data struct design & analysis; & stats & probability theory. #1615.3271 backend sw dvlpmnt; C or C++ multithread w/ STL; script lang, Linux script lang; web tech, data analysis or data mining lang; mach learn, info retrieval, data mining, or nat lang process, relational databases, perf tuning & debug; & MapReduce, Hadoop, or similar distrib compute.

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Software Engineer in Test (NY, NY) #1615.5623 Design, develop, modify, and/or test software needed for various Google projects. Exp incl: Python, Java, or C++; Windows & Linux; Chrome & Firefox, & code analysis.
Software Engineer Positions (NY, NY) Design, develop, modify, and/or test software needed for various Google projects. Exp incl: #1615.3260 front-end tech, UI tech, Jscript; Java, web app dvlpmnt; & HTML. #1615.965 OO UI dvlpmnt; web srvr-client commun; Java; HTML, CSS, & Jscript; AJAX, & front-end & user-facing app. #1615.5696 data struct; algorithms, & databases, design & dvlpmnt of distrib data process appls in C++; data visualization or GUI app dvlpmnt; graph query process or ntwrk graph analysis, multithread; analysis of distrib storage syst; bldng web apps in PHP or Jscript & HTML; & Shell or Python script, Linux or UNIX; & REST or SOAP web srvcs. #1615.3855 game theory, incl auction theory; C++; large-scale data process, multi-obj optimization, & parallel & distrib compute.

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Software Engineer Positions (San Francisco, CA) Design, develop, modify, and/or test software needed for various Google projects. Exp incl: #1615.1518 Jscript, srvr-side Jscript, & Jscript unit test, AJAX, cross-browser dvlpmnt; HTML5, & Python. #1615.5956 C & C++; Java, Python; distrib syst; multithread, perf analysis & imprvmnt, design RESTful API, & security through sandboxing. #1615.871: Java, C++, Python; MapReduce, complex algorithms; mach learn, nat lang process; mach translation; design patterns; & large-scale data process.

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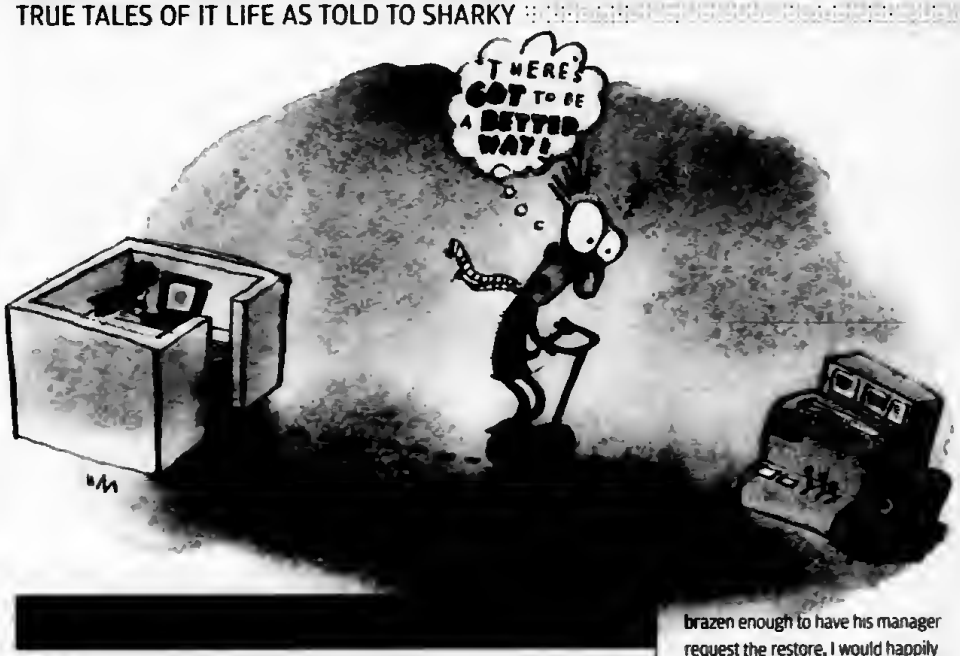

A Request Too Far

This IT pilot fish is called into a meeting with the plant manager and a dozen supervisors at a mostly automated manufacturing facility. "The supervisors asked me if I could write a program that would automatically fill the daily spreadsheets they had to prepare with data concerning the output of the manufacturing machines and set up a report on a Web page," says fish. "The program would save them from having to walk to the machines – about 30 yards away, on the other side of a glass wall. I asked them to verify that they wanted me to automate a process that would tell them how well machines that were 30 yards away were operating. They confirmed that was the plan. The plant manager ended the meeting. The next week, maintenance guys began moving the supervisors' cubicles next to the machines."

Impending Doom

It's the late 1990s, and a user calls this sysadmin pilot fish asking to have a directory restored – a directory named Doom. "I was a little suspicious, because I'd just been doing some management-directed file system cleanup deleting non-business-related files," says fish, "including personal photo collections, music and games, in order to free up storage on servers that have just tens of gigabytes of disk space." Sure enough, a quick check reveals that the Doom directory holds an extensive game with multiple worlds, maps and scenarios taking up multiple gigabytes – and the logs say this user has been holding game sessions that began during company hours and lasted long into the night. Fish calls the user back: "We'll be happy to restore it for you. Just have your manager send us an email requesting the restore. Make sure the restore request has the full file path in it." Reports fish, "I figured if the user was brazen enough to have his manager request the restore, I would happily do so. After five days and no restore request, I deleted the game files."

Also Works on Stormy Days

Pilot fish gets a call from a friend who says her computer works only at night. Says fish, "As I questioned her analysis as too bizarre and likely coincidental, she was insistent. 'No,' she said, 'it really only works at night. During the day it won't even turn on.' An on-site investigation found that the dear soul had plugged her power strip into a switched outlet – and she didn't flip on the wall switch that supplied power to that outlet unless she wanted to use her table lamp. So – *voilà!* – the computer could be turned on when it grew dark in the evening, but not during daylight hours."

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OPINION

SCOT FINNIE

Is Apple OK?

MORE THAN most technology companies, Apple lives and dies by how well it delivers innovative electronics, software and services. The company has weathered many ups and downs in the course of its history, but since 1998, Apple has been recognized as being bold, innovative and successful.

Those were the days between Steve Jobs' return and his death, in 2011.

2013 has been mighty thin in terms of Apple product launches.

Since Tim Cook took the helm, Apple has stumbled. Its stock peaked at over $700 in September 2012 and has spent much of 2013 down around $400, only recently moving to $500 territory. There's been a lot of criticism of the company by media, analysts and the financial community — some of it warranted. Over the last two years, Apple's biggest new products have been the iPhone 5, the iPad Mini and the Retina MacBook Pro. The Retina display aside, they're all derivative and either play catch-up or, in the case of the iPhone 5, lag behind in both worldwide market share and leap-forward product innovation.

What's more, 2013 has been mighty thin in terms of Apple product launches. You have to go back to 2005 to find a year with fewer new hardware releases. (Beginning in January 2006 and throughout that year, the company released new Intel-based versions of all of its Macs.)

So, has Apple lost its mojo? Has it run out of innovative ideas? I believe that what we're witnessing this year is the end of the pipeline of in-the-works projects from the Jobs era. To be sure, there are plenty of other test-tube ideas Apple is developing that Jobs had a hand in. There has been a delay in 2013, but it's understandable. The first six months under a new CEO must have been a time of uncertainty for Apple employees. It gave them pause. Cook is nothing like Jobs, and that had to affect Apple's corporate culture. It's this adjustment period that resulted in a slow 2013.

All the same, while it's clear that Apple can iterate existing products very well, can the company still hit home runs with new ideas — as it did with the iMac, OS X and the iPod, iPhone and iPad?

As I write this, Apple's next unveiling, on Sept. 10, is the subject of much speculation. But it looks to be much ado about very little. Apple is expected to announce an iPhone 5S, said to be a minor refresh, with highlights being the inclusion of iOS 7 and fingerprint-scanner login authentication. It's also been widely reported a midrange-priced iPhone 5C will be available in multiple colors. Not a particularly exciting lineup. If unsubstantiated reports are true, things get somewhat better in October, when it's believed that Apple will introduce a thinner, lighter iPad 5 and a new iPad Mini with a Retina display. Somewhere along the way, Apple will also release a mild revision of OS X, called Mavericks. Beyond that, the rumors are hazy and a little surprising: iWatch (which may be more important as a decorous dongle for mobile payments than anything else) and an Apple-designed TV, dubbed iTV by the press.

If Apple doesn't have "one more thing" by June next year, it may be in trouble. The folks in Cupertino can't afford to rest on their laurels. But this is Apple we're talking about. The company hasn't blown it under Cook's tenure. It just hasn't done anything amazing yet.

And Cook is just one guy out of 41,700 talented Apple employees. Apple is OK. Besides, if there's any company that deserves the benefit of the doubt, it's Apple. It's too soon to count it out. ◆

Scot Finnie is *Computerworld*'s editor in chief. You can contact him at sfinnie@computerworld.com and follow him on Twitter (@ScotFinnie).

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